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The concentration of N_1, i.e. the number of circles per unit of surface, can be expressed by the Eq.(10) where n is the number of currents crossed by an aircraft taking temperatures along the path L .

b) In the case of air bubbles, apart from their shape, it is necessary to consider the question of their spatial distribution. This can be expressed as a distribution of the ellipsoids (11) and (12) with their concentration. The probability of horizontal cross-sections of the ellipsoids having the dimensions from l to $l + dl$ will be Eq.(13). The conditional probability (14) is equal to the ratio of the elliptic rings (having axes a_1 and a_1/m with thickness da_1) to the surface of the ellipse (having axes a and a/m). If Eq.(15) is the density probability function of the ellipsoids distribution and N_2 the number of the ellipsoid centres per unit of the volume, the equation (16) is the number of ellipsoids along the horizontal

Card3/11 straight line (a^2 = the second moment). From Eqs.(17) and

Statistical Methods of Determination of Effective Parameters of
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(14) substituted into Eq.(13), an integral equation (18)
can be formed which expresses the _ _ationship between the
distribution of the ellipsoids and the chords.   The
solution for this equation is given by (19).
The concentration of ellipsoids N_2 , i.e. their number per
unit of volume, according to Eq.(16) can be expressed as
Eq.(20), where n = total number of ellipsoids along the
path L .
It should be noted that the Eq.(18) contains no reference
to m .   Therefore, it can be applied to all shapes of the
air bubbles, such as sphere (m = 1) , vertical ellipsoid
($m < 1$) or horizontal ellipsoid ($m > 1$) .
3) A relative surface S of the air current at any cross-
section is expressed by Eq.(21) where s^2 = second moment.
The value of S can be obtained from the observations.
By multiplying both parts of Eq.(8) by l and integrating
for l , the Eq.(22) is obtained (l = mean chord).
The number of ellipsoids (23) on a horizontal surface
(cross-section) can be calculated from Eqs.(3) and (5) where

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$\bar{a}$ = mean length of the horizontal axes. The density of ellipsoids intersecting a surface $u(a)$ is Eq.(24). The probability of obtaining the circles of diameters from s to $s + ds$ on the intersected surface is Eq.(25) and the conditional probability of the surface being formed by cutting an ellipsoid at the distance from its centre y to $y + dx$ will be Eq.(26). From Eqs.(26) and (24) substituted into (25), the equation (27), expressing the distribution of circles on a horizontal surface is formed. It is assumed that a surface under consideration represents the surface of flight. Then, taking Eq.(28) instead of $F_2(a)$ in Eq.(19) and $N_1 = N_2 \bar{a}/m$ from Eq.(23), an

equation (29) is obtained. This is the same as (9), thus (30) is being formed, which indicates that the relative surface of the ascending air in both cases can be determined by Eqs.(21) or (22). Also, it is evident from Eq.(30) that the distribution of circles on a horizontal surface is independent from the kind of air convection, The relative volume V of the air bubbles can also be

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Observed Convective Currents

shown as Eq.(31), where $\bar{a}^3$ = third moment. In this
case, the relative volume of the convective current is
equal to the relative surface of any horizontal cross-
section.

4)   The equations can be applied in the cases of air
being either stationary or in motion with winds gradually
varying with height. In the latter case, the convective
currents will be of an inclined elliptic shape. But their
cross-section will be represented as a circle. Therefore,
the Eqs.(9) (10) and (21) (22) can be applied. Similarly,
Eqs.(14) and (19)(20) can also be applied for the air
bubble in these conditions.

5)   In order to determine the statistical relationship
between the dimension and the temperature of the convective
current, it is necessary to consider their joint distri-
bution, i.e. to solve a question with the two independent
variables.

In the case of air bubbles, the probability of the
horizontal cross-section of ellipsoid having a given
rate of the temperature increase is calculated by Eq.(32).

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This equation can only be solved when the temperature
condition (33) is satisfied. Therefore, Eq.(34) will
be integrated in respect of one variable only. If the
internal temperature of the ellipsoid changes according
to Eq.(36), then Eq.(37) will be obtained. Here, l and T
are two independent variables with T included in the
integral as a parameter. By introducing a new variable,
c (38), the Eq.(37) will change into (39), where c can
be considered as a parameter. After both parts being
differentiated in respect of l, the function (40) or
(41) is obtained.
In the case of the airstream, the temperature change will
follow Eq.(42) and the above probability will be expressed
by (43), which can be written as (44), where $T_{o,s}$ is
the internal temperature varying according to Eq.(45).
By the inclusion of Eq.(45) into F_2 in Eq.(44), the form
(46) is obtained, which can be written as Eq.(47).
Assuming that the profile of the temperature distribution
(48) represents a circle, the Eqs.(49) and (50) will be

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obtained. These are solved by substituting the variable
by $T = cl$ in Eq.(51) in order to obtain the final
solutions (52) and (53).

6) If more variables are included which could represent
a number of conditions in the interior of ellipsoids or
circles, the Eqs.(54) to (59) will be necessary. The
previously derived Eqs.(8), (18), (37),(43),(49),(50 and
their solutions (9),(19),(40),(46),(52),(53) can be treated
as the particular cases of (54) and (55) with the
solutions (58) and (59).

7) As it was shown before, it is possible to consider
the distribution of circles or ellipsoids grouped according
to their dimensions and the central temperatures instead
of the distribution of chords. In order to do that,
Eqs.(60) and (61), formed from (8) and (18), should be
introduced, then Eq.(62) will be found. In the case of
two independent variables, as it may occur when the tempera-
ture changes according to Eqs.(36) or (42), the required
distribution will follow the Eqs.(63) to (66). Taking the

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temperature changes (48) instead of (63) and (64), the Eqs.(67) and (68) will be derived with the limits similar to Eqs.(65) and (66).

8) The Eqs.(9),(19),(40),(46),(52) and (53) express the distribution based on the functions $w(l)$ or $w(l, T)$ found experimentally from a great number of flights. However, a simpler method can be applied for calculation of two or more independent variables.

Eqs.(37) and (43) with the substitution (38) or Eqs.(49) and (50) with (51) are transformed independently of the variables l and c . In particular, the Eq.(43) will be obtained in a form (69). Denoting the number of the simultaneous observations as $f_{k+0.5; i+0.5}$, the Equations (70) and (71) are formed. By changing the succession of integration of the last two integrals and by integrating in respect of l , the Eq.(72) will be obtained. The second integral can be presented in the form of Eq.(73) and instead of (72), a system of algebraic equations (74) to (76) can be used with the coefficients being independent

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of k . If Eqs.(49) and (50) are included, these equations
become (77) and (78).
The equations of the type (74) are easy to evaluate. The
evaluation of (74) and (75) with the coefficients is shown
in Tables 1 and 2. The tables show the distribution of
dimensions at an interval c which was taken from the
Eqs.(79) and (80). The data from the tables can be con-
sidered as having only one independent variable, i.e. the
index k+0.5 being omitted.
9) As an example, the data of 5 flights over the Ukraine
in June, 1956, is given. The total time of the flights
was 10 - 13 hours at   heights ranging from 10 - 50 m
to 1 500 - 2 000 m. The majority of observations were
made at 300 - 500 m (Table 2).
Figure 1 shows the probability density functions of the
following distributions: chord dimension $w(l)$, circle dim.
$F_1(s)$, horizontal axis of ellipsoid $F_2(a)$.

Figure 2 represents the probability density functions of
two independent variables of the following distributions:
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chord dimension and temperature $w(l, T)$ (the upper graph),
circle diameter and temperature $F_1(s, T_0)$ (the middle
graph), horizontal axis of ellipsoid and temperature
$F_2(a, T_0)$ (the lower graph).

There are 2 figures and 2 tables and 9 references,
5 of which are Soviet, 3 English and 1 French.

ASSOCIATION: Akademiya nauk SSSR Institut prikladnoy geofiziki
                (Institute of Applied Geophysics,   Ac.Sc.USSR)

SUBMITTED: December 23, 1957

Card 11/11   1. Atmosphere--Motion   2. Clouds--Development
                3. Convection--Analysis   4. Mathematics--Applications

WUL'FSON, N.I., Doc Phys-Math Sci — (diss) "Study of convective motions in free atmosphere." Mos, 1959. 14 pp (Acad Sci USSR. Inst of Applied Geophysics). 225 copies.   List of author's works at end of text (10 titles) (KL, 37-59, 105)

3 (8)

AUTHOR: Vul'fson, N. I.   SOV/20-126-6-27/67

TITLE: On the Mechanism of _Terminable_ Instability ~~Lease~~ in the Free
              Atmosphere (O mekhanizme razresheniya neustoychivosti v
              svobodnoy atmosfere)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 6, pp 1244 - 1247
              (USSR)

ABSTRACT: In recent years a method was developed of announcing convective
              rising airflows by the aid of sensitive thermometers. The tem-
              perature distribution in the flow is determined by statistical
              integration of the measuring results. The distribution function
              (1) and the temperature profile (3) of the flow are given. Mea-
              surements reveal that the temperature distribution profile va-
              ries but little with altitude; figure 1 shows a graph depicting
              the variation of temperature in the center of the flow with al-
              titude. Formula (4) describes the temperature drop in the axis
              of flow. Next, equations (5) and (6) are given for the tempera-
              ture- and velocity variations in the axis of turbulent flows.
              These equations are expanded for any arbitrary point in the
              flow (9) (10). Results reveal that dimensions of convective
Card 1/2   flow systematically decrease with rising instability and turbu-

On the Mechanism of Evacuation of Instability Lease   SOV/20-126-6-27/67
the Free Atmosphere

> lence of atmosphere. Furthermore, it follows that instability
> evacuates in free atmosphere in the form of a spontaneous con-
> vective flow. There are 2 figures, 2 tables, and 9 references,
> 5 of which are Soviet.

ASSOCIATION: Institut prikladnoy geofiziki Akademii nauk SSSR (Institute of
Applied Geophysics of the Academy of Sciences, USSR)

PRESENTED: February 16, 1959, by L. I. Sedov, Academician

SUBMITTED: February 11, 1959

Card 2/2

PHASE I BOOK EXPLOITATION   SOV/5682

Vul'fson, Naum Isaakovich

Issledovaniye konvektivnykh dvizheniy v svobodnoy atmosfere .
(Investigation of the Convective Motions in the Free Atmos-
phere) Moscow, Izd-vo AN SSSR, 1961. 251 p. Errata slip
inserted. 1,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut prikladnoy
geofiziki.

Resp. Ed.: I. A. Kibel', Corresponding; Member, Academy of Sciences
USSR; Ed. of Publishing House: G. G. Gus'kov; Tech. Eds.: T. A.
Prusakova and G. N. Shevchenko.

PURPOSE : This book is intended for scientific workers in physics
of the atmosphere and certain related fields (e.g., aviation and
atmospheric pollution control). It may also be used by students
in meteorological institutes and faculty members of university
departments of physics.

Card-1/7

Investigation of the Convective (Cont.)   SOV/5682

COVERAGE: The book presents results of an investigation of con-
    vective motions in the free atmosphere and in cumulus clouds.
    A large portion of the book is devoted to substantiating the
    observational precedures and instrumentation of aircraft flights
    required for acquiring the basic data, and methods of process-
    ing, studying, and statistically interpreting the observational
    results. Basic convection parameters and their variation with
    changing physicogeographical conditions, the mechanism for the
    development of convective motions in the free atmosphere, and
    the association between convective motions within and without
    clouds can be established from the data presented. The obtained
    results are valuable for understanding the mechanism of con-
    vection and the development of convective clouds and for their
    possible uses as quantitative indices of phenomena associated
    with convective motions. The author thanks Academician Ye. K.
    Fedorov (scientific advice); V. V. Shchelokov, V. I. Skatskiy,
    A. M. Gromov (design of apparatus): N. V. Davydkin and I. S.
    Pavlova (installation and operation of apparatus); A. I.
    Korzhov, V. N. Shlyakov (deceased), P. N. Radkevich

Card 2/3

Investigation of the Convective (Cont.)   SOV/5682

and N. S. Kolesov (commanders of flight crews); V. M. Bovsheverov, L. M. Levin, I. A. Kibel', Corresponding Member AS USSR, A. M. Obukhov, Corresponding Member AS USSR, A. Kh. Khrgian, Professor, and N. Z. Pinus, Doctor of Physics and Mathematics (critical remarks); S. V. Pshenay-Severin (editorial assistance). There are 149 references: 61 Soviet, 70 English, 9 German, 8 French, and 1 Polish.

TABLE OF CONTENTS:

Card 3/7₃

VUL'FSON, N.I., doktor fiz.-matem. nauk, otv. red.; LEVIN, L.M.,
doktor fiz.-matem.nauk, otv. red.·Prinimali uchastiye:
KOMAROV, N.N., red.; PSHENAY-SEVERIN, S.V., red.; UGAROVA, K.F.,
red.; NIKOLAYEVA, L.K., red. izd-va; BERKGAUT, V.G., red. izd-va;
VOLKOVA, V.V., tekhn. red.

[Study of clouds, precipitation, and thunderstorm electricity;
reports] Issledovaniia oblakov, osadkov i grozovogo elektri-
chestva; doklady. Otv. red. N.I.Vul'fson, L.M.Levin. Moskva,
Izd-vo Akad.nauk SSSR. 1961. 327 p.   (MIRA 15:1)

1. Mezhvedomstvenraya konferentsiya po voprosam issledovaniya
oblakov, osadkov i atmosfernogo elektrichestva. 6th, 1959.
          (Cloud physics—Congresses)

VUL'FSON, N.I.

Irregularities·of the atmospheric refractive index in the radio frequency region caused by convective motions. Izv. AN SSSR, Ser. geofiz. no.1:141-149 Ja '61.   (MIRA 14:1)

1. Akademiya nauk SSSR, Institut prikladnoy geofiziki.
        (Refraction)   (Radio waves)

L 14977-63   EWT(1)/BDS   AFFTC/ASD/ESD-3   RB

ACCESSION NR: AP3005438   8/0020/63/151/005/1089/1092

AUTHOR: Vul'fson, N. I.

TITLE: Influence of air humidity on the development of convection in a cloudless atmosphere

SOURCE: AN SSSR. Doklady*, v. 151, no. 5, 1963, 1089-1092

TOPIC TAGS: humidity, humidity field, atmospheric convection, humidity non-homogeneity, water vapor, convection, thermal convection, vapor transport

ABSTRACT: Under certain conditions air humidity is more important than temperature in the development of atmospheric convection. In-flight measurements were made over the Black Sea in August 1962 with a low-inertia thermometer, a sensitive automatic dew-point hygrometer, and an accelerometer. Flights were made in the daytime in cloudless and almost windless weather. At heights of 25—50 m above the water surface, the instruments detected humidity nonhomogeneities which differed as much as 2.0—2.5 mb from the relatively uniform humidity background. Stratification of the lower layers of the air was virtually neutral. The convection phenomenon in the humidity field appears to be an important

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L 14977-63
ACCESSION NR: AP3005438

fector in a number of problems of atmospheric physics. For example, water vapor evaporating from the surface of the seas and oceans is transported upward primarily by convection resulting from the instability of the lower air layers. In the winter and during summer nights, when the water is warmer than the adjacent air layers, vapor is transported by thermal convection; during daytime in summer, when there is a thermally neutral or even weakly stable stratification. vapor is transported by convection associated with the humidity field. The article was presented by Academician Ye. K. Fedorov on March 15, 1963. Orig. art. has: 1 figure and 16 formulas.

ASSOCIATION: Institut prikladnoy geofiziki Akademii nauk SSSR (Institute of Applied Geophysics, Academy of Sciences SSSR)

SUBMITTED: 15Mar63   DATE ACQ: 06Sep63   ENCL: 00

SUB CODE: AS   NO REF SOV: 017   OTHER: 002

Card 2/2

VUL'FSON, N.I.; GUSAK, N.A.; SKATSKIY, V.I.

Relation of microstructure parameters to convective motions in clouds. Izv. AN SSSR. Fiz. atm. i okeana 1 no.1:76-83 Ja '65.
(MIRA 18:5)

1. Institut prikladnoy geofiziki AN SSSR.

VUL'FSON, N.I.; IVANOV, V.N.

Structure of the temperature field in cumuli. Dokl. AN SSSR
159 no.4:786-788 D '64   (MIRA 18:1)

1. Institut prikladnoy geofiziki AN SSSR.

VULISTON, N.I.; IRVIN, L.M.

Downward convective currents. Dokl. AN SSSR 158 no.6:1320-
1323 O '64.   (MIRA 17:12)

1. Institut prikladnoy geofiziki AN SSSR. Predstavleno
akademikom Ye.K. Fedorovym.

VUL'FSON, N.I.; GUTMAN, L.N.; PAVLOVA, I.S.

Effect of gravitation waves on the formation of hail clouds
in a mountainous area. Meteor. i gidrol. no.1:23-29 Ja '64.
(MIRA 17:3)

1. Institut prikladnoy geofiziki AN SSSR i Vysokogornyy
geofizicheskiy institut.

ACCESSION NR: AP4010573   S/0050/64/000/001/0023/0029

AUTHORS: Vul'fson, N. I.; Gutman, L. N.; Pavlova, I. S.

TITLE: Effects of gravitational waves on the formation of hail clouds in mountainous regions

SOURCE: Meteorologiya i gidrologiya, no. 1, 1964, 23-29

TOPIC TAGS: gravitational wave, hail cloud, cumulus cloud, wind velocity, temperature gradient, precipitation, hail

ABSTRACT: The authors' purpose is to examine the conditions under which the effects of gravitational waves may lead to the formation of vertical movements sufficiently intense to have a noticeable influence on the development of hail clouds. They consider the model of an infinitely long mountain range of arbitrary cross section and with transverse wind of constant velocity. They derive equations for air movement and compute values for different heights and breadths of the mountains. These computations show that wave forms developed by a mountainous zone may lead to the formation of strong, stationary, ascending movements of air. To test this, they investigated the relationship between development of hail in the Alazani valley and fields of temperature and wind favorable for producing atmospheric waves. For completeness and comparison they also examined temperature

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ACCESSION NR: AP4010573

and wind fields associated with cumulus rain clouds not producing hail as well as fields associated with cumulus clouds yielding no precipitation at all. The relationship of precipitation to wind and to temperature gradient is illustrated by Fig. 1 on the Enclosure. For winds blowing parallel to the range, regardless of temperature gradient, the weather was fair (for the four years represented by the data of Fig. 1). All kinds of clouds were observed for winds blowing at right angles to the trend of the range, but hail was more likely the nearer the wind direction was to this right-angle direction, and the higher the temperature gradient was. This means that hail is most probable under conditions most favorable for the development of gravitational waves. Orig. art. has: 3 figures and 15 formulas.

ASSOCIATION: Institut prikladnoy geofiziki (Institute of Applied Geophysics); Vy*sokogorny*y geofizicheskiy institut (High-Mountain Geophysical Institute)

SUBMITTED: 00   DATE ACQ: 14Feb64   ENCL: 02

SUB CODE: AS   NO REF SOV: 002   OTHER: 002

Card 2/2

VUL'FSON, N.I.

Effect of humidity on the development of convective movements in a cloudless atmosphere. Dokl. AN SSSR 151 no.5:1089-1092 Ag '63.   (MIRA 16:9)

1. Institut prikladhoy geofiziki AN SSSR. Predstavleno akademikom Ye.K.Fedorovym.

(Humidity) (Atmosphere)

Separating saturated from unsaturated ketones. N. S. Yul'fson and A. A. Pryanishnikov. Russ. 43,422, June 30, 1935. The sepn. is based on the more rapid interaction of satd. ketones with $NaHSO_3$ ar'n.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

10

Preparation of secondary octyl alcohol and sebacic acid.
Yu. M. Svetlov and N. S. Vul'feon. *J. Applied Chem.*
(U. S. S. R.) 9, 1613-23(In French 1625)(1936).— A
sec. $C_8H_{17}OH$ was distd. from a mixt. of technical castor
oil (1 kg.) and a soln. of 98% NaOH (331 g. in 750 cc.
of water), with the reacting mixt. at 112-17° and the vapor
at 90°. One kg. of castor oil yielded 125-335 g. of crude
sec. $C_8H_{17}OH$. This product was purified by heating with
phthalic anhydride at 110-18° for 12 hrs., recrystg. the
ester (b. 55°) in gasoline (b. 60-70°), decompg. the ester
with fused K_2CO_3, and distg. the final product in vacuo.
Sec. $C_8H_{17}OH$, redistd. under atm. pressure, b. 178.4°, d_4^{0}
0.82008-0.82000, n_D^{20} 1.4264. The purification of the sec.
$C_8H_{17}OH$ with 5% $KMnO_4$ in such amt. as to cause MnO_2
formation in 15-20 min. after its addn. yielded a sec.
$C_8H_{17}OH$ b. 179.2°, d_4^{0} 0.81963-0.11965, n_D^{20} 1.4265-
1.4266. Sebacic acid was obtained as a by-product of the
above distn. After removal of the sec. $C_8H_{17}OH$, the residue
was dild. with 3 l. of hot water, half-neutralized with concd.
H_2SO_4 (4% of the residue by vol.), and the sepd. lower
layer was completely neutralized with the same acid. The
white ppt. of sebacic acid was recrystd. from 85% HCO_2H
(1:5 ratio by vol.). It m. 126-9°. Expl. details are given.
Twenty-eight references.
A. A. Podgorny

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

10

Condensation of bromoacetaldehyde with malonic acid. N. S. Vul'fson and M. M. Shemyakin. *Compt rend. acad. sci. U. R. S. S.* 29, 305-7 (1940) (in English) — To 10 g. of malonic acid, 5 cc. of piperidine was added Heat was evolved. When the mixt. began to cool, 12.5 g. of BrCH₂CHO was added. After 24 hrs. the reaction mixt. was heated for 2 hrs. in an oil bath at 105-15°, when CO₂ and water were given off. The mixt. was poured into 250 cc. of 5% H₂SO₄ and the flaky ppt. (about 1 g.) was filtered off and washed with ether. The product was assigned the structure of a *d*-lactone acid: BrCH. CH·CH(CO₂H)·CO·O. The proof of its structure rested on the behavior of the product toward alk. hydrol. There should be and there was a break in the compd. and formation of BrCH₂CHO and malonic acid, which actually were recovered, the latter as Ba malonate. The product was insol. in water, alc. and benzene and very slightly sol. in ether.

Rebecca Yablonski

METALLURGICAL LITERATURE CLASSIFICATION

BC   N.S. VULFSON

β-Lactones and β-lactoneacids. III. Condensation of
citral with malonic acid. N. S. Vul'fson and M. M.
Shemyakin. *J. Gen. Chem.* (U. S. S. R.) 13, 436-47
(1943)(English summary); cf. *C. A.* 37, 611⁹.—Malonic
acid (20 g.), 30 g. citral and 3 cc. glacial AcOH are treated
with 3 cc. piperidine, heated on a water bath for 1.5 hrs.
when the mass solidifies. After washing with Et₂O, the
solid is crystd. from 60% alc., to yield 19 g. (40%) of the
dilactone of citrylidenemalonic acid, Me₂C:CHCH₂CH₂-

O—CO
| |
CMe.CH₂.CH.CH.CO.O, (I), m. 186-7°. The mother
liquors yield citrylideneacetic acid, b₁₂ 165-75° (decomp.).
I (1 g.), heated to soln. with 4 cc. 10 N NaOH, boiled for
2-3 min. and acidified by dil. H₂SO₄, yields 0.50 g. Me₂C-
CHCH₂CH₂CMe(OH)CH₂CH.CH(CO₂H).CO.O, m. 113-

14° (after extn. with hot benzene); the evapd. benzene
extract yields 0.1 g. Me₂C.CHCH₂CH₂CMe(OH)CH₂-
CH.CH₂.CO.O (II), m. 120-0.5°; a soln. of the Na salt

of the above acid, on acidification, yields the mixt. of the
acid and the above lactone, indicating fairly ready de-
carboxylation; the Ag salt of the acid appears to have an

appreciable water soly., while AcCl leads to loss of some
CO₂ and yields II. I boiled with 10 N NaOH and acidi-
fied, yields 67% II, which, treated with slight excess of 0.1
N NaOH, acidified by HNO₃ and treated with AgNO₃,
gave Me₂C.CHCH₂CH₂CMe(OH)CH₂CH:CHCO₂Ag. II
is not affected by Ac₂O in pyridine at about 100°, while
AcCl yields 47.5% Me₂C:CHCH₂CH₂CMe(OAc)CH₂-
CH.CH₂.CO.O m. 117-18° (from benzene). Oxidation

of II by alk. KMnO₄ yielded (CO₂H)₂ while no HCO₂H was
detected, thus indicating the presence of the β-lactone
ring. IV. The rate of opening of the β-lactone ring.
M. M. Shemyakin and N. S. Vul'fson. *Ibid.* 448-60
(English summary).—The authors studied the rate of ring
opening of the lactones Me₂C.CH(CO₂H).CO.O and

PhCH.CH(CO₂H).CO.O at various temps. The results,

presented in tabular and graphical form, show that the
ring opening of β-lactones is a 1st-order reaction. There
are indications that the hydrolysis in alk. medium leads to
unsatd. acids and that the hydrolysis reaction is a tauto-
meric one. For the 2 lactones tried (above) the activa-
tion energy of hydrolysis was found to be 19,321 and
22,832 cal., resp.
O. M. Kowalson

VULFSON, N. S.

"Investigation of B-Lactones and B-Lactono-Acids. IV. Study of the Reaction Rate of the Cleavage of the Lactone Ring". Shemyakin, M. M. and Vulfson, N. S. (p. 455)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1943, Volume 13, no. 6.

PROCESSES AND PROPERTIES INDEX

Chemical nature of vitamin A. N. S. Vul'fson, Us-
pekhi Khim. 13, 437-61(1944); cf. C.A. 37, 6657^.—A
review of the chemistry of vitamin A and vitamin A,
and the carotenes, including degradation, synthesis, and
analytical methods, with 130 references. S. Gottlieb

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

Research in β-lactones and β-lactono acids. V. Mixed anhydrides of malonic and acetic acids. N. S. Vul'fson. *J. Gen. Chem.* (U.S.S.R.) 19, No. 10, a309-81(1949)(English translation).—See C..I. 44, 1901f.

E. J. C.

β Lactones and β lactono acids. V. Mixed anhydrides of malonic and acetic acids. N. E. Vul'fson. Zhur. Obshchei Khim. (J. Gen. Chem.) 19, 1101-16(1949); cf. C.A. 38, 3253. $CH_2(CO_2H)_2$ with Ac_2O yields 2 mixed aceto-malonic anhydrides in a reaction catalyzed by H_2SO_4. Shaking 10 g. powd. $CH_2(CO_2H)_2$, 40 g. Ac_2O, and 3 drops H_2SO_4, until soln. occurs and letting stand overnight, followed by concn. in vacuo at 40-50°, gave a sirup which on treatment with 15 ml. abs. EtOH, followed by cooling and extn. with Et_2O, gave 1.5 g. MeOAc and 60°, $CH_2(CO_2Me)_2$ (I, b. 71.7°, n_D^{20} 1.4140), while an ext. with Na_2CO_3 gave 21.7% $HO_2CCH_2CO_2Me$ (II, b. 115.8° decompn.). If the reaction mixt. above after vacuum concn. is extd. with Et_2O and the ext. is treated with MeOH, there is formed 2.6 g. MeOAc, 81% I, and 22% II, as well as a trace of $CH_2(CO_2H)_2$. Similar results are obtained if H_2SO_4 is omitted and the mixt. is allowed to stand 24 hrs. before concn. and reaction with MeOH. ($CH_2CO_2Ag)_2$ (12.8 g.) with 6.3 g. AcCl in Et_2O give upon filtration a yellow sirup, which gave 91.5% I with MeOH; 8.4 g. Ag salt and 3.1 g. AcCl gave 84.7% II and 13.5% MeOAc. The mixed anhydride from 10 g. $CH_2(CO_2H)_2$ and 10 g. Ac_2O gave with 20 g. BuOH, 2.7 g. $CH_2(CO_2H)_2$, 30%, $HO_2CCH_2CO_2Bu$ (undistillable without decompn.), and 11.5% di-Bu ester, as well as 3.5 g. BuOAc; similar reaction with 12 g. Me_3COH gave 35.7% $HO_2CCH_2CO_2CMe_3$ (isolated as the Ag salt), and 14.5% di-tert-Bu ester, b. 230-5° (with some decompn.), as well as 1 g. tert-BuOAc; 2-octanol (25 g.) gave 2.2 g. $CH_2(CO_2H)_2$, 0.5 g. 2-octyl acetate, 14.5% 2-octyl H malonate, and 13.9% corresponding neutral ester, b. 109-70°, n_D^{20} 1.4367. Dodecylalc. (35 g.) gave a small amt. of dodecyl acetate, b. 110-52°, 16.5% didodecyl malonate, m. 33-4°, and 23% dodecyl H malonate, m. 42-3° (from iso-Am_2O); 20 g. PhOH gave a little PhOAc, 13.2%, di-Ph malonate, m. 49.5-51.0°, and 17.3%

Ph H malonate, m. 65-6° (from iso-Am_2O), while 10 g. $PhNH_2$ gave 71%, malonanilide, m. 223-4.5° (from MeOH); similar addn. of 13 g. $PhNH_2$ in 25 ml. Et_2O gave 12 g. of the anilide while the Et_2O mother liquor yielded about 1 g. AcNHPh and the alk. ext. gave 4.5 g. malonanilic acid, m. 110.2° (from AcOH), which on heating to the m.p. gave AcNHPh. Addn. of 2 drops H_2SO_4 to 5 g. II and 20 ml. Ac_2O, letting stand 24 hrs., and evapn. in vacuo at 50° gave the mixed anhydride of acetic acid and II, b. 70-1°, b. 64.5°, n_D^{20} 1.4105, which (3 g.) treated with 5 ml. MeOH gave I, while 3 g. $PhNH_2$ gave 0.1 g. AcNHPh and 1 g. II; treatment of the mixed anhydride with p-$O_2NC_6H_4CH_2OH$ on boiling for 1 hr. gave p-nitrobenzyl acetate and malonate, m. 77-9° and 82.5-84.0°, resp. Allowing 1 g. $HO_2CCH_2CO_2Bu$ and 10 g. Ac_2O to stand 24 hrs. gave 30% mixed anhydride of acetic acid and Bu H malonate, b. 116-18°, which (1 g.) with 2 g. $PhNH_2$ gave AcNHPh. Similarly $HO_2CCH_2CO_2Ph$ gave the corresponding mixed anhydride with Ac_2O, m. 55.5-56.0° (from iso-Am_2O), giving HO_2C-CH_2CO_2Ph and AcNHPh with $PhNH_2$.   G. M. K.

FDD PA 169T28

VULFSON, N. S.

USSR/Chemistry - Laboratory Equipment

Sep 50

Continuous-Action Counterflow Extraction Apparatus for Laboratory Use,"
F. N. Stepanov, N. S. Vulfson, I. A. Mikova, Sci Res Inst of Org Intermediate
Products and Dyestuffs

"Zavod Lab" Vol XVI, No 9, pp 1131.

New apparatus for extraction from solutions was constructed and tested in
operation. Extraction occurs in narrow vertical tube in which solution and
solvent, flowing toward each other, are stirred vigorously by spiral ribbon mixer.
Apparatus is designed for operation with types of solvent heavier or lighter
than solution. Main advantage of extractor is its efficiency, and small amount
of solvent used.

PA 169T28.

VUL'FSON, N.S.; PODREZOVA, T.N.; SENYAVINA, L.B.

Dieckmann reaction. Part 13: Infrared and ultraviolet spectra
of methyl- and carbethoxy derivatives of 3-chromanone. Zhur.
ob. khim. 34 no.8:2676-2681   Ag '64.   (MIRA 17:9)

1. Institut khimii prirodnykh soyedineniy AN SSSR i Nauchno-
issledovatel'skiy institut organicheskikh poluproduktov i krasiteley
(NIOPiK).

PUCHKOV, V.A.; STEPANOV, V.M.; VUL'FSON, N.S.; ZYAKUN, A.M.; KRIVTSOV, V.F.

Mass spectrometry of amino acid methylthiophydantoins. Dokl.
AN SSSR 157 no.5:1160-1163 Ag '64.   (MIRA 17:9)

· 1. Institut khimii prirodnykh soyedineniy AN SSSR.

C.A.   10

β-Lactones and β-lactono acids VI Mechanism of formation of β-lactono acids. N. S. Vul'fson. /kur (Mükhel Aküm J. Gen. Chem.) 20, 125 31(1950); cf. C.I. 44, 6102a. It has been shown that only the neutral malonic acetic anhydride (I) is capable of reacting with carbonyl derivs.; the mixed acidic anhydride does not react. H_2SO_4, which catalyzes the anhydride formation, does not participate in the reaction with CO derivs. The 1st step of the reaction of I with Me_2CO is the formation of the mixed anhydride of AcOH and $Me_2C(OH)CH(CO_2H)_2$, which undergoes an intramol. reaction yielding the lactono-acid and AcOH. Crude I and Me_2CO, allowed to stand overnight, readily yield 18.6 55.5% isopropylidene-malono-β-lactone, $RR'C:CH(CO_2H)CO.O(R, R' = Me)$

m. 93.7° (from Me_2CO or C_6H_6), also obtained in 48.6% yield from 6.4 g. $CH_2(CO_2Ag)_2$ in 10 g. dry Me_2CO with 10 g. AcCl (added dropwise), followed by filtration and standing overnight; BzCl instead AcCl gives the same product, in addn. to some BzOH (amts. unstated). The crude I from 10 g. $CH_2(CO_2H)_2$ and 10 g. BzH, let stand overnight, gave 22.9% benzylidenemalono-β-lactone, m. 143.6° (decompn.; from $Me_2CO-C_6H_6$), also obtained (1 g.) by addn. of 6.4 g. $CH_2(CO_2H)_2Ag$ to 10 g. BzH, followed by 5 g. AcCl. m-$O_2NC_6H_4CHO$ in the 1st reaction gave 0.4 g. m-NO_2 analog, m. 154.5 50.0° (from MeOH), while cyclohexanone (1:1) gave 1.5 g. cyclohexylidenemalono-β-lactone, m. 84.5°. The lactono acids were isolated in the form of the resp. Ag salts (undescribed and used only for analyses). When $Me_2CH:C(CO_2H)_2$ was treated with a trace of H_2SO_4 in Ac_2O, no lactonization took place even in 3 days, nor did its di-Ag salt yield any lactone with AcCl in Me_2CO; the benzylidene analog behaved similarly.

Addn. of 3 drops concd. H_2SO_4 to 0.2 g. $Me_2C:CHCO_2H$ in 25 ml. Ac_2O, followed by 2 hrs. at 60° and standing for 2 days gave, after distn. of the Ac_2O in vacuo and washing the residue with Na_2CO_3 soln. (in Et_2O), 4 g. isopropylidene-acetic anhydride, b_3 100-2°, b_1 117-18°, which yields the anilide, m. 127.5-8.0° (from EtOH); 0.5 g. original acid is reclaimed. $Me_2C:CHCO_2Ag$ with AcCl in Et_2O gave only the free acid, m. 67.5 9.0°. Addn. of 10 g. AcCl to 6.4 g. $CH_2(CO_2Ag)_2$ in 15 ml. dry Me_2CO, followed by filtration and sepn. of the filtrate into parts (a) and (b) gave from part (a), allowed to stand 2 hrs. after filtration, an unstated amt. of $CH_2(CO_2H)_2$, and from part (b), allowed to stand 1 day, an unstated amt. of isopropylidenemalono-β-lactone. A similar reaction in which the 24-hr. filtrate was treated with dry MeOH gave MeOAc, $CH_2(CO_2Me)_2$, AcOH, and a small amt. of the above lactone. PhOH instead of MeOH gave di-Ph malonate, m. 48.5 9.5°. Distn. of the 24-hr. filtrate yielded a small amt. of Ac_2O and the above lactone. VII Relationship between structure of carbonyl compounds and the product of its condensation with malonic acid. Ibid. 145 51. The reactions of neutral acetic malonic anhydride (I) with CO derivs. indicate that the presence of an actual or potential OH group in the carbonyl compd. leads to formation of malonic esters and not the lactono acids; the latter form predominantly if the carbonyl deriv. is capable of resonance, with considerable local resonance in the CO group. The condensation does not occur if many resonant structures are possible in which the pos. pole is not at the C atom. I (from 10 g. $CH_2(CO_2H)_2$ and 10 g. AcPh in 48 hrs. at room temp. gave 2.5 g. 2-phenylethylidenemalono-β-lactone, m. 91.5-2.0° (Ag salt of free acid used in analysis). Menthone

(over)

(15 g.) in a 24-hr. reaction gave 4.8 g. *menthylidenemalono-β-lactone*, needles, m. 107.6–8.0° (decompn.; from MeOH); both the *Ag salt* of the lactone and *di-Ag salt* of the *free acid* were analyzed. PhCH₂CH₂CHO (13.5 g.) gave in 24 hrs. 3.6 g. *hydrocinnamylidenemalono-β-lactone*, m. 130–40° (from Me₂CO-MeOH) (*Ag salt* of the *lactone*). o-Cl-C₆H₄CHO (7 g.) gave 1.5 g. *o-chlorobenzylidenemalono-β-lactone*, m. 125.0–5.5° (from CHCl₃) (the *Ag salt*); *p-Cl analog* (1.1 g.), obtained similarly, m. 151–5° (from EtOH-Me₂CO) (*Ag salt*); *m-Cl analog*, m. 101–2° (from EtOH and C₆H₆), was obtained in 2.5-g. yield (*Ag salt*). Diacetone alc. (21 g.) yielded 1 g. *acid ester of diacetone alc.* and CH₂(CO₂H)₂, AcCH₂CMe₂OCOCH₂CO₂H, an odoriferous yellow oil, yielding a semicarbazone, m. 233–4° (from EtOH). Paraldehyde (15 g.) gave 4.5 g. *acetaldol acid malonate*, C₇H₁₀O₅, an oil yielding a semicarbazone, m. 152–4° (from EtOH); *AcH* reacts similarly, and the same product forms from AcCl, AcH, and CH₂(CO₂Ag)₂. EtCHO (20 g.) gave 5 g. orange *propionaldol acid malonate*, C₈H₁₂O₅; semicarbazone, m. 177–9° (from EtOH). I [from 30 g. CH₂(CO₂H)₂] and 45 g. AcCH₂CO₂Et gave 15 g. of the corresponding *enol acid malonate*, C₉H₁₂O₆, a yellow oil, yielding the *p-nitrobenzyl ester*, m. 32.5–4.0°. I [from 10 g. CH₂(CO₂H)₂] and 15 g. mesityl oxide gave 3 g. of *enol acid malonate*, oil, C₉H₁₂O₆ (*Ag salt*), also obtained from AcCl, CH₂(CO₂Ag)₂, and mesityl oxide. *Pseudoionone* (10 g.) with I gave 3 g. of the *enol acid malonate*, oil, C₁₆H₂₂O₆ *Ag salt*. PhCH:CHCOMe (15 g.) gave the *enol acid malonate* (4 g.), oil (*Ag salt*). I and 15 g. Cl₃CCHO gave in 24 hrs. 8 g. *chloral diacetate*, t₁ 111.5–12.5°, b₇ 98–9°,

d₄² 1.4214; reaction of 6.4 g. CH₂(CO₂Ag)₂ with 6 g. Cl₃CCHO and 10 g. AcCl gave in 24 hrs. 3 g. *chloral chloroacetate*, Cl₃CCH(ClO)Ac, b. 190–7°, d₄² 1.4773. Citral gave mostly a tar and a little *p-cymene*; furfural gave a tar, while Ph₂CO and p-Me₂NC₆H₄CHO failed to react. VIII. Condensation of cinnamaldehyde with malonic acid. *Ibid.* 503–0.—Crude acetic malonic anhydride (from 10 g. malonic acid) and 13.2 g. PhCH:CHCHO, let stand 1 day, yielded 6 g. malonic acid and 3 g. *cinnamylidenemalonic acid* (I), m. 205–6°, sepd. by CHCl₃ extn.; evapn. of the mother liquor yielded 3 g. PhCH:CHCH(·CO)₂C:CHCH:CHPh, (II), m. 154–7.5° (from ligroin-C₆H₆), also obtained in 7.5-g. yield (m. 155.3–5.7°) from 3 drops concd. H₂SO₄, 10.4 g. malonic acid, 25 g. Ac₂O, and 14 g. PhCH:CHCHO after 1 day's standing; some I also forms. Titration of II uses 1 equiv. of NaOH and evapn. of the C₆H₆ ext. of the reacidified soln. regenerates II; if the product, however, is boiled with alkali, 2 equivs. of NaOH are used and acidification yields I. Pure II, m. 156.5–7.5°, is obtained in 0.7-g. yield by treating 0.6 g. I and 1 drop of concd. H₂SO₄ with 0.6 g. I and 1 drop of concd. H₂SO₄ and letting stand 1 day. AcCl (5 g.), 0.6 g. CH₂(CO₂Ag)₂, and 2.7 g. PhCH:CHCHO let stand 1 day and the AgCl removed gave 1.4 g. *cinnamylidenemalono-β-lactone*, m. 132–3° (from Me₂CO); addn. of AgNO₃ to the neutralized soln. gave the *Ag salt*, C₁₂H₈O₄Ag; the salt formed after boiling the acid in alk. soln. was C₁₂H₈O₄Ag₂. Boiling the lactone with Me₂CO 3 hrs. gave some I (from MeOH) and unchanged lactone. *Cinnamaldehyde diacetate*, m. 84–5°, prepd. in 11.5-g. yield from 10 g. PhCH:CHCHO and 5 g. Ac₂O with a trace of H₂SO₄, is unstable on storage. IX. Decarboxyla-

C. A.

(cont'd)

tion of β-lactono acids. *Ibid.* 600-2.— Heating 1 g. isopropylidenemalono-β-lactone with 10 ml. Ac₂O 25 hrs. to 60-70° gave on distn. in vacuo, 0.3 g. *β,β-dimethylacrylic acid*, m. 64-6°, also obtained (0.2 g.) on similar treatment of 1.5 g. Me₂C:C(CO₂H)₂. Heating 3.5 g. benzylidenemalono-β-lactone with 35 ml. Ac₂O 20 6 hrs. at 60-70° similarly gave 1.5 g. *cinnamic acid*. The formation of unsatd. acids from thermal treatment of the β-lactono acids in Ac₂O is an apparently general reaction and Mansot's [*Ber.* 27, 1225(1894)] synthesis of Me₂C:CHCO₂H from Me₂CO and malonic acid with Ac₂O probably involves β-lactono acid formation. X. β-Lactone of menthylideneacetic acid. *Ibid.* 603-5.—Dehydration of Et menthola-cetate according to Wallach (*Ann.* 323, 151(1902); *C.A.* 1, 2400) gave *Et menthenylacetate*, b₇ 125.7°, and *menthylidenacetate - β - lactone*, H₂C.CH(Me).CH₂.CH.CH(iso-

Pr).C.CH₂.CO.O, b₇ 138-41°; the latter opens the ring on heating with 0.1 *N* NaOH and acidification of the mixt. yields a product which is again not titrated by cold NaOH; i.e. the ring opening is reversible. Addn. of AgNO₃ to carefully neutralized (HNO₃) soln. which had been boiled 0.5 hr. with excess NaOH gave the Ag salt of the acid, C₁₂H₁₉O₃.Ag. Oxidation of the lactone with KMnO₄ in Me₂CO gave menthone, the same being obtained from Et menthola-cetate; menthone is not affected. When the lactone is boiled with 50% KOH, menthone is formed. The results indicate that Wallach's proposed structure of the lactone (γ-lactone) is incorrect and that β-lactone is the correct formulation.

VUL'FSON, N.S.

USSR/Chemistry-Beta -Hydroxy Acids   Apr 52

"The Problem of Preparing β-Hydroxyacids; Some Re-
marks on the Articles of A. M. Gakhokidze "Con-
densation of Ketones With Esters of Organic Acids;'"
N. S. Vul'fson

"Zhur Obshch Khim" vol XXII, No 4, pp 718-720

In repeating Gakhokidze's expts on producing
β-hydroxy acids, his findings were not confirmed.
The consts of the original malinc ester cited by
Gakhokidze do not agree with the consts of the
diethyl and dimethyl esters of malonic acid. The
consts of diethyl ester or isopropylidene malonic
acid cited by the authors do not correspond to the
                                              224T54

consts given for this compd. Gakhokidze and Guat-
sadze's suggested method for sepg hydroxy acids by
saponification with alcoholic alkali was not
applied, because these substances decomp easily.

224T54

VUL'FSON, N. S.

Defended his Dissertation for Doctor of Chemical Sciences, Kazan' State University
1953

Dissertation: "Investigation of Beta-Hydroxy Derivatives of Malonic Acid"

SO: Referativnyy Zhurnal Khimiya, No. 1, Oct. 1953 (W/29955, 26 Apr 54)

VUL'FSON, N. S.

The Reformatskii reaction with bromomalonic ester. Condensation of bromomalonic ester with cinnamaldehyde. N. S. Vul'fson, *Sbornik Statei Obshchei Khim., Akad. Nauk S.S.S.R.* 1, 533-6(1953).—To 116 g. dry $MgCO_3$ and 160 g. $CH_2(CO_2Et)_2$ in 200 ml. abs. Et_2O was added at 0° 50 g. powd. KOH (temp. rise to 8-12°) and the mixt. kept 2 hrs. in the cold, then 10 days at room temp. with occasional shaking, gave 100 g. K Et malonate. No condensation was achieved, since the liquid portion of the mixt. consisted of $CH_2(CO_2Et)_2$ only (cf. Gakhokidze and Guntsadze, C.A. 42, 2570i and V., C.A. 47, 1704h). Refluxing 10.6 g., BzH, 24 g. $BrCH(CO_2Et)_2$, and dry C_6H_6, and 6.55 g. Zn shavings (pretreated with 10% HCl, washed and heated with a little iodine) 3 hrs. gave after cooling, and acidification with dil. H_2SO_4 an orange oil, which suffers decompn. during attempted distn. *in vacuo* yielding a distillate which is brightly colored (red or blue); redistn. gave 10 g. dl-Et benzalmalonate, b_{11} 185-7°, readily hydrogenated to the dihydro deriv., which is hydrolyzed to the free acid, m. 116-17°. Free benzalmalonic acid m. 191-2°. If the mixt. (above) is sapond. directly with 5% NaOH in the cold in MeOH, there is obtained a solid ppt. which treated with dil. H_2SO_4 also gave benzalmalonic acid. The product which had not been heated (e.g., in the course of distn., above) does not take up H. Thus the directly formed intermediate must be a β-hydroxy deriv., which loses H_2O on heating and yields the benzalmalonate. The HO deriv. could not be isolated in the pure state. Et H benzalmalonate, m. 91-2°, is formed in small amts. during the above reaction.
G. M. Kosolapoff

VUL FSON — N. S

β-Lactones and β-lactono acids. XI. Reformatskiĭ reaction with bromomalonic ester. 2. β-Lactone of benzilmalonic acid. N. S. Vul'fsn. *J. Gen. Chem. U.S.S.R.* 24, 1817–18(1954)(Engl. translation).—See *C.A.* 49. 13108c. — B. M. R.

Vul'fson, N.S.

USSR/Chemistry - Reaction processes

Card 1/1   Pub. 151 - 28/37

Authors   : Vul'fson, N. S.

Title   : Study of beta-lactones and beta-lactonic acids.   Part 11.- The Reformatzky reaction with bromomalonic ester.   II. beta-lactone of benzalmalonic acid

Periodical : Zhur. ob. khim. 24/10, 1853-1855, Oct 1954

Abstract   : The derivation of beta-lactone of benzalmalonic acid through the reaction of acetyl chloride with sodium salts formed during the saponification of the benzaldehyde - bromomalonic ester condensation (according to Reformatzky), is described. The product derived from a Reformatzky reaction between benzaldehyde and bromomalonic ester, and the intermediate product formed during the formation of beta-lactonic acid, are listed. Four references: 3-USSR and 1-USA (1936-1953).

Institution : The K. E. Voroshilov Scientific Research Institute of Semi-Products and Dyes

Submitted   : May 8, 1954
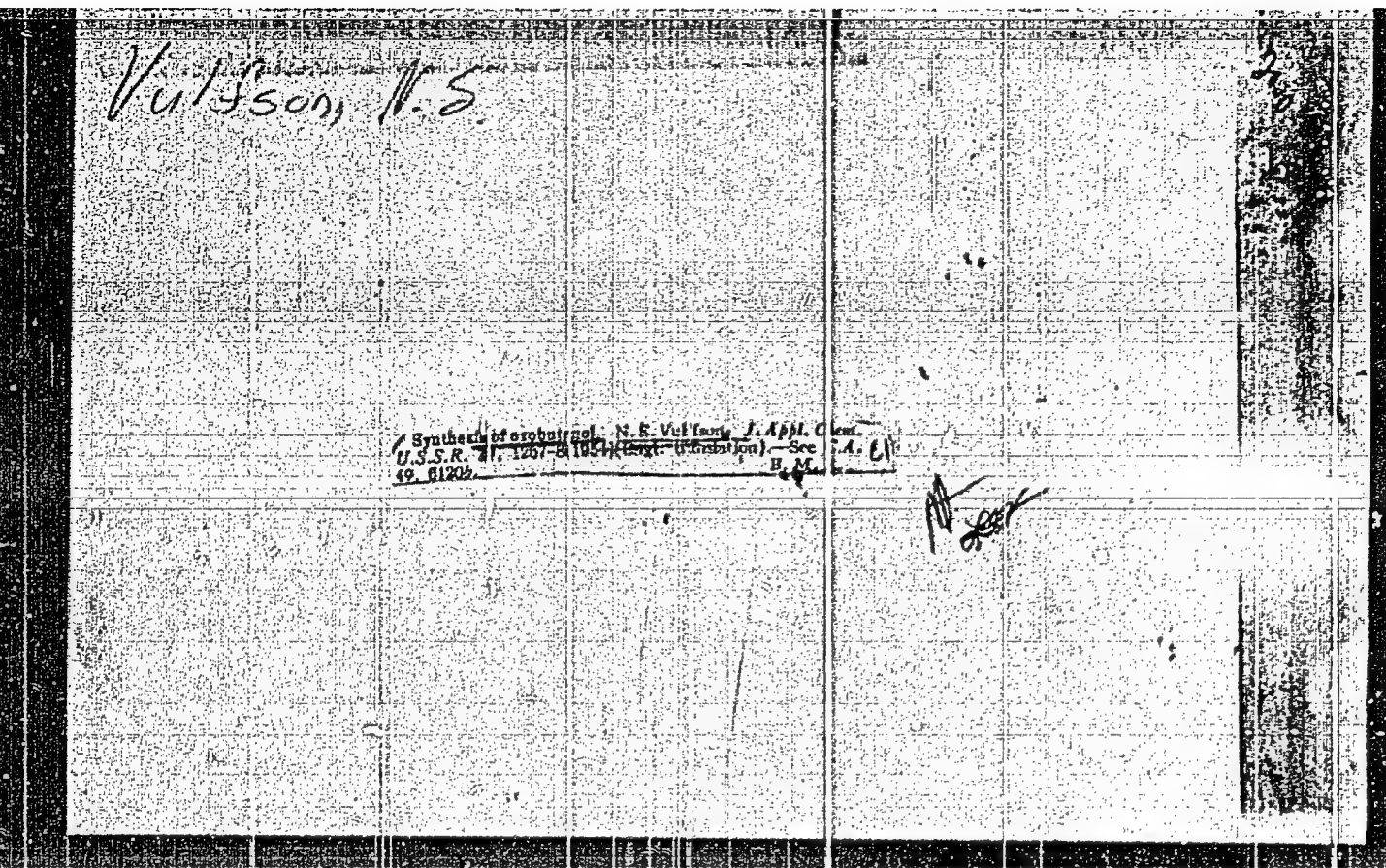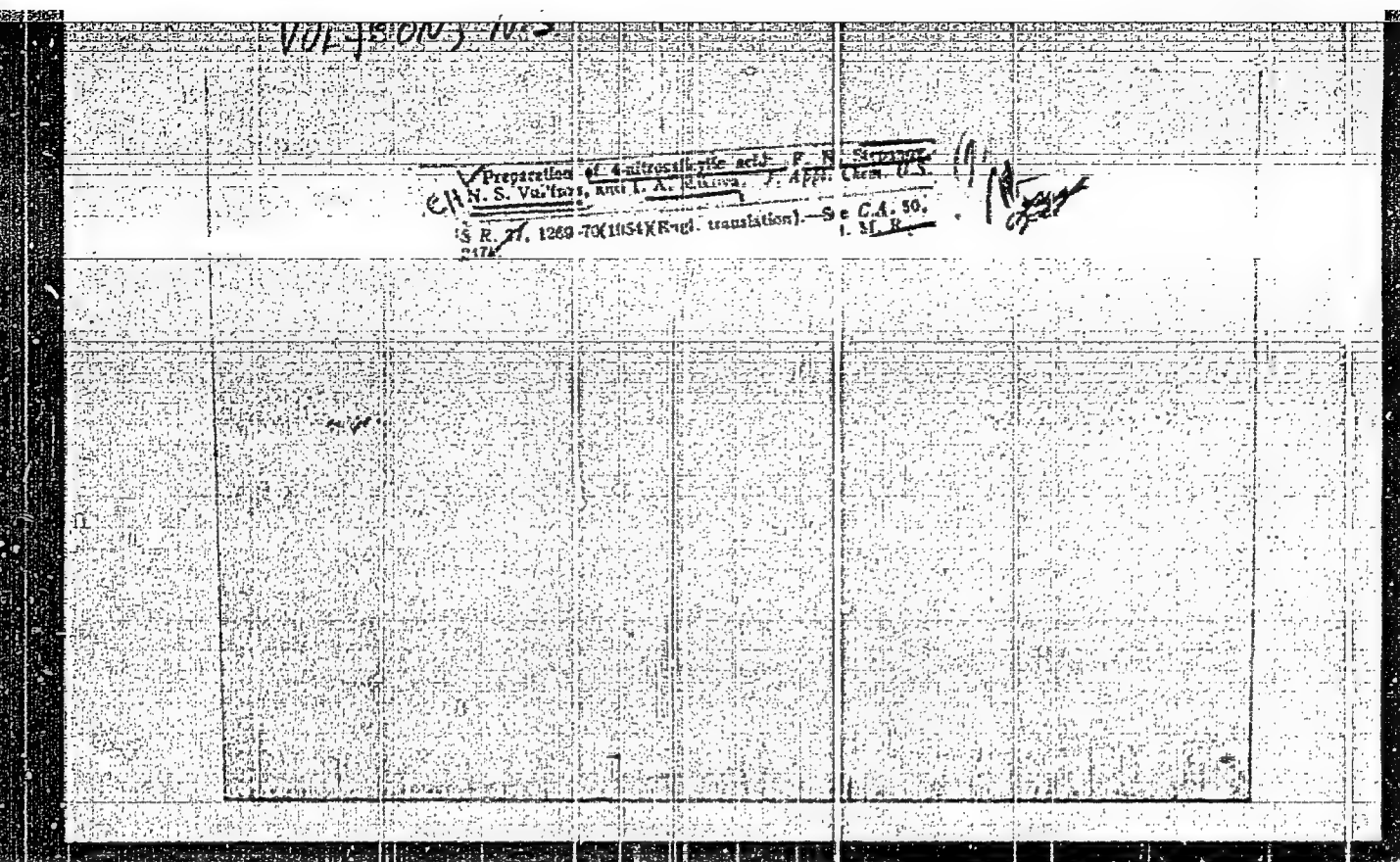
Vulfson, N.S.

Synthesis of orobal-sol. N. S. Vulfson, J. Appl. Chem.
U.S.S.R. 21, 1267-8 (1951)(Engl. translation).—See C. A.
49, 6120b.
B. M.

Preparation of 4-nitrosalicylic acid. F. N. Stepanov,
N. S. Vul'fson, and I. A. Glazova. J. Appl. Chem. U.S.
(§ R. J. 1269-70)(1954)(Engl. translation).—S e C.A. 50,
217f.

USSR.

Synthesis of probutanol. N. S. Vu?fson (K. E. Voroshilov Inst. Org. interned. and ... ...). Zhur. Priklad. Khim. 27, 1119–21(1954).—To 14?? g. Me$_2$CO and 370 g. 17% formalin. was added gradually about 6 cc. 4% NaOH until pH 7.6 was reached; over 1 hr., the soln. was kept, with appearance of yellow color and a slight rise in temp., more NaOH being added if needed to maintain alkalinity; after 20? hrs. at 33°, 6 g. hydroquinone was added, stirred briefly, and heated rapidly to relieve Me$_2$CO distn. to 82-t° in the reaction flask, followed by filtration and distn. of the liquid; gave after 2 fractionations 60-5% ?-butanol-2-one. The best results are obtained at pH 7.5 for 3-6 hrs. total duration. Reduction or elimination of the amt. of hydroquinone listed above gave severe losses in the yield.

G. M. K??inoff

Vul'fson, N. S.

6

Preparation of 4-nitrosalicylic acid. N. N. Sitnikov, N. S. Vul'fson, and I. A. Antonova (K. E. Voroshilov Sci. Res. Inst. Org. Intermed. and Dyes, Moscow). Zhur. Priklad. Khim. 27, 1313-5(1954).—To 140 ml. 27.5% NaOH, 500 ml. H₂O, and 130 g. ice was added in 1 hr. 60 g. 4-nitrophthalimide, stirred 1 hr. at 5-8°, treated over 20 min. with 120 ml. NaOCl soln. (14% active Cl), stirred 1 hr., heated to 60°, allowed to cool slowly over 18 hrs., filtered and acidified, yielding 86% mixed nitroanthranilic acids, m. 237-41°. This (50.5 g.) added at 97° to 300 ml. 50% H₂SO₄, cooled to 3°, diazotized with 57 ml. 40% NaNO₂, stirred 0.5 hr. and added to 350 ml. H₂O and 470 g. CuSO₄, kept at 0.6-8°, stirred 1 hr., filtered hot and washed with H₂O, gave 87.1% mixed nitrosalicylic acids, m. 183-204°. This (35 g.) in warm soln. of 16 g. NaHCO₃ in 500 ml. H₂O, was filtered, heated to 90-5°, acidified with 18 ml. 18% HCl and cooled, yielding 18 g. crude product, which crystd. from 300 ml. 30% EtOH gave 16 g. pure 4-nitrosalicylic acid, m. 219-30°.

G. M. Kosolapoff

HENRY, Thomas Anderson; DITKOVSKIY, D.P. [translator]; SUVOROV, N.N.,
[translator]; RODIONOV, V.M., akademik, redaktor [deceased];
VOL'FSON, N.S., doktor khimicheskikh nauk, redaktor; LEVINA,
N.M., otvetstvennyy redaktor; SHPAK, Ya.G., tekhnicheskiy
redaktor

[The plant alkaloids. Translated from the English] Khimiia
rastitel'nykh alkoloidov. Perevod s angliiskogo. Pod red. V.M.
Rodionova. i N.S.Vul'fsona. Moskva, Gos. nauchno-tekhn. izd-vo,
khim. lit-ry, 1956. 904 p.   (MLRA 10:1)
        (Alkaloids)
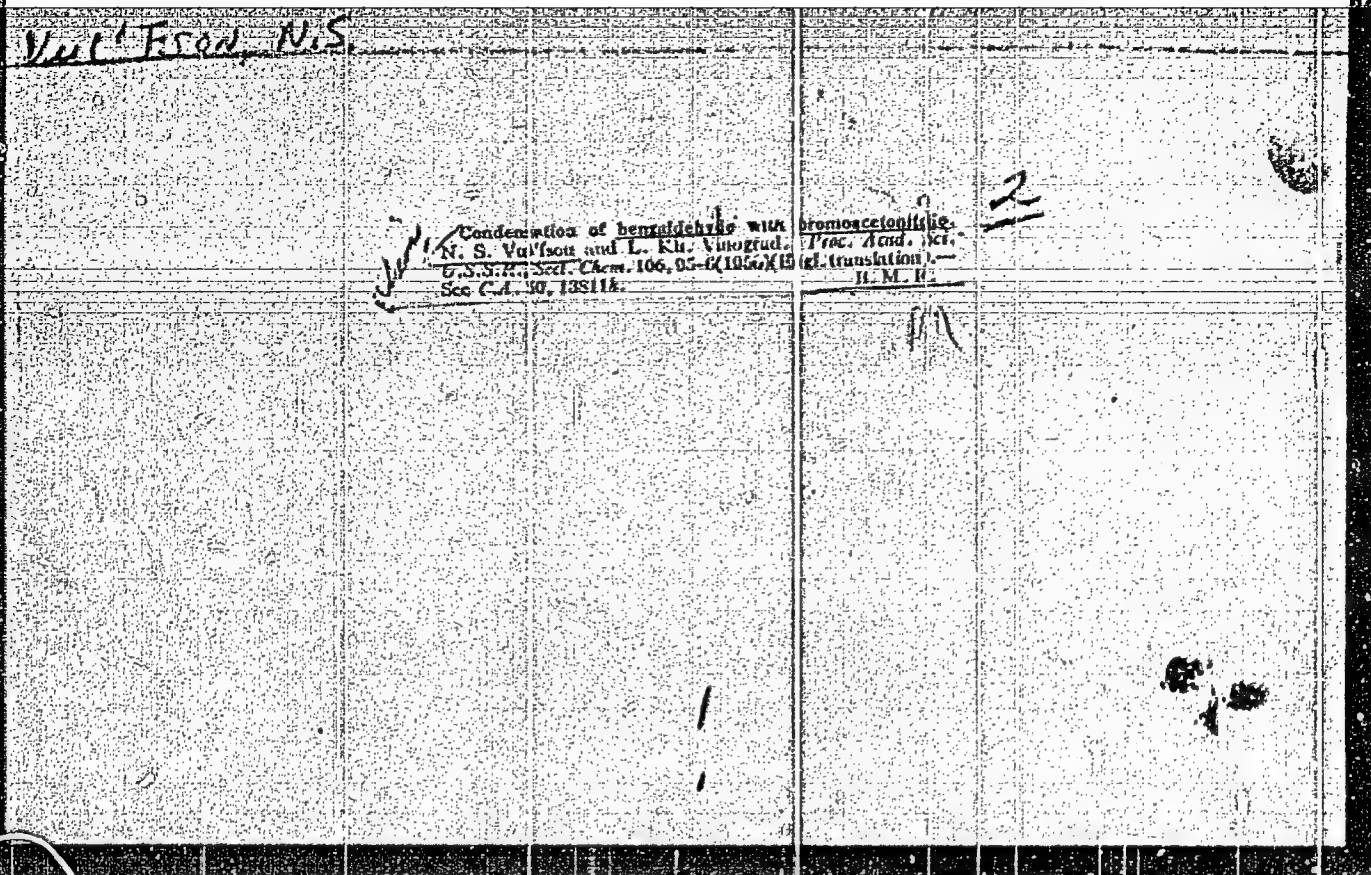
Vul'fson, N.S.

Condensation of benzaldehyde with bromoacetonitrile. N. S. Vul'fson and L. Kh. Vinograd. Proc. Acad. Sci. U.S.S.R., Sect. Chem. 106, 05–6(1956)(Engl. translation).— See C.A. 50, 13811h. H. M. E.

Condensation of benzaldehyde with bromoacetonitrile. N. S. Vul'tson and L. Kh. Vinograd. Izdy Akad. Nauk S.S.S.R. 106, 509-70(1956).—To a refluxing soln. of 21.3 g. BzH, 32 ml. C₆H₆, and 5 ml. Et₂O contg. 18 g. activated Zn dust there was added in 0.5 hr. 24 g. BrCH₂CN. After refluxing 1 hrs. the cooled mixt. was stirred 1 hr. with 120 ml. 10% H₂SO₄, filtered, sepd., the org. layer extd. with 10% H₂SO₄ and H₂O, and the combined aq. layers extd. with C₆H₆ and combined with the original org. layer. Distn. gave 14.2 g. PhCH(OH)CH₂CN, b.p. 117–51°. This shaken with 12% H₂O₂ in the presence of 1 drop of NaOH and little BtOH gave the corresponding amide, m. 120° (from EtOH). Refluxing the nitrile with 4% NaOH gave 63.6% PhCH:CHCO₂H.   G. M. Kosolapoff

Vul'fson, N.S.

Distr: 4E/1

Dieckmann reaction. I. Synthesis of o-phenyleneacetic acid-β-propionic acid and its ester, labeled with carbon-14 in the carboxyl group of the propionic acid. L. S. Vul'fson and M. O. Iodko. *Ukrain. Khim. Zhur.* 23, [?]6-8(1957)(in Russian).—2-[?]BrC₆H₄OH and NaC¹⁴N form in (CH₂OH)₂ contg. CuCN and Cu at 140-50° 3,2-HOC[?] C¹⁴N, hydrolyzed to 5,2-HOC₆H₄C¹⁴O₂H, m. 216-18°, converted by Na and -AmOH to o-EtO₂CCH₂C₆H₄CH₂CH₂C¹⁴[?]Et (I), b. 191-3°. II. Mechanism of the cyclization of diethyl o-phenyleneacetic-β-propionate. P. N. Stepanov, M. O. Iodko, and N. S. Vul'fson. *Ibid.* [?]89-92.—Cyclization of I with Na in C₆H₆ contg. EtOH forms Et 1,2,3,4-tetrahydro-3-oxo-2-naphthoate-carboxy-C¹⁴ (II), b. 103-4.5°, n¹⁵ 1.5198; Cu deriv., m. 164-5°. When hydrolyzed and decarboxyl-ated 3,4-dihydro-2(1H)-naphthalenone-2-C¹⁴, b. 93-5°, was formed. This shows that the ring formation is between the CO₂Et group of the propionic acid and the H of the acetate. The Na deriv. of II and MeI form Et 1,2,3,4-tetrahydro-1-methyl-2-oxo-1-naphthate, b. 113-15°, n¹⁵ 1.1240, hydro-lyzed and decarboxylated to 3,4-dihydro-1-methyl-2(1H)-naphthalenone, b. 101-12°, n¹⁵ 1.5196; semicarbazone, m. 193-6°.

John H [?] Scott

Vul'fson, N.S.

STEPANOV, F.N.; IODKO, M.O.; VUL'FSON, N.S.

Investigation of Dieckmann's reaction. Part 2: Mechanism of the cyclization reaction of diethyl ether of o-phenyleacetic-β-propionic acid. Ukr.khim.zhur. 23 no.4:489-492 '57.   (MIRA 10:10)

(Chemical reaction--Mechanism)
(Propionic acid)

VUL'FSON, N.S.

79-2-21/64

AUTHORS: Vul'fson, N. S. , Zaretskiy, V. I.

TITLE: Investigations in the Field of Dieckmann (Dikman)'s Reaction
(Issledovaniye v oblasti reaktsii Dikmana)
III. Cyclization of the Diethyl Ether of α-Methylpimelic Acid
(III.Tsiklizatsiya dietilovogo efira α-metilpimelinovoy kisloty)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 2, pp. 369 - 372 (USSR)

ABSTRACT: The cyclization of the diethyl ether of α-methylpimelic acid was
described by Dieckmann (Dikman) (reference 1). He supposed that
2-methyl-6-carbethoxycyclohexanone is formed on that occasion, but
it was not eliminated in a pure state. As a continuation of the
investigation of the cyclization process of the unsymmetrical di-
carbonic acid ether (reference 2), according to Dikman, the authors
wanted to determine the structure of the β-keto ether. The latter
is produced by the cyclization of the diethylether of α-methyl-
pimelic acid. The keto ether (I) is obtained as the only product.
The formation of β-keto ether could not be determined. It is assum-
ed that the exclusive formation of β-keto ether (I) in the cycli-
zation is a consequence of the increased electron density at the
α-carbon atom under the influence of the I-effect of the CH₃ group
This renders the dissociation of the proton and the formation of

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79-2-21/64

Investigations in the Field of Dieckmann (Dikman)'s Reaction . III. Cyclization of the Diethyl Ether of α -Methylpimelic Acid

the organic anion, which are necessary for the cyclization, diffi-cult. Summary: The authors investigated the cyclization of the diethyl ether of α -methylpimelic acid according to Dikman. It was shown that 2-methyl-6-carbethoxycyclohexanone is the primary reaction product ; the formation of 2-methyl-6-carbethoxycyclohexa-none was not observed. The structure of 2-methyl-6-carbethoxycyclo-hexanone was confirmed by the production of 2,6-dimethylcyclohexa-none which was obtained by methylation with methyl iodide and sub-sequent hydrolysis and decarboxylation. There are 13 references, 2 of which are Slavic.

ASSOCIATION: Scientific Research Institute for Organic Semiconductors and Dyes (Nauchno-issledovatel'skiy institut organicheskikh poluprovodnikov i krasiteley)

SUBMITTED: January 21, 1957

AVAILABLE: Library of Congress

Card 2/2

VUL'FSON, N.S.; ZHURINA, F.G.; SENYAVINA, I.B.

Interaction of bromocyanoacetic ester with aromatic aldehydes in the Reformatskii and Widequist reactions. Dokl. AN SSSR 157 no.3:603-606 Jl '64.   (MIRA 17:7)

1. Institut khimii prirodnykh soyedineniy AN SSSR i Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley. Predstavleno akademikom M.M. Shemyakinym.

Vul'fson N.S.

AUTHORS: Zaretskiy, V. I. , Vul'fson, N. S.   70-2-24/64

TITLE: Investigations in the Field of Dikman's Reaction. (Issledovanije
v oblasti reaktsii Dikmana) IV. Cyclization of the Tetraethyl-
ether of 2-Methylpentantetracarboxylic-1,1,5,5,-Acid (IV. Tsikli-
zatsiya tetraetilovogo efira 2-metilpentantetrakarbonovoy-1,1,5,5
kisloty)

ABSTRACT: The authors continued the investigation of Dieckmann (Dikman)'s
(reference 1) and investigated the cyclization of the tetraethyl-
ether of 2-methylpentantetracarboxylic-1,1,5,5-acid (I). It be-
came evident that in the presence of pulverised sodium in benzene
the cyclization of tetraether (I) is not possible (the initial
tetraether is regenerated). But in the presence of sodium ethylate
in an alcohol solution it takes place. 3-methyl-2,6-dicarbethoxy-
cyclohexanone (II) forms in a yield of 44,5 %. The cyclization
is accompanied by a splitting off of diethylcarbonate (references
2, 3) which is formed during the distillation process of reaction
products. The structure of the keto ether (II) is confirmed by the
values of the elementary analysis, of the molecular refraction as
well as by the formation of 3-methylcyclohexanone (III), as a re-

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79-2-24/54

Investigations in the Field of Dikman's Reaction. IV. Cyclization of the Tetraethylether of 2-Methylpentantetracarboxylic-1,1,5,5,-Acid

sult of its hydrolysis and the decarboxylation. The constants of the latter correspond to those described in publications for this substance (references 4-6). The initial tetraethylether of 2-methylpentantetracarboxylic-1,1,5,5-acid (I) was obtained by the condensation of 1,3-dibromobutane with sodium diethyl malonate. In the interaction of the stoichiometric quanta of the malonic ester and the dibromide the yield of tetraether (I) amounted to 12,8 %, although sodium bromide was obtained in a quantity of 90 %. In the condensation of 1 Mol of 1,3-dibromobutane with 2 Mol of sodium diethyl malonate and in the presence of a large excess of malonic ester (4 Mol) the tetraether was obtained according to a method analogous to that by V. P. Gol'mov and B. A. Kazanskij (reference 7), with a yield of 36,9 %. A further increase in the excess of malonic ester does not influence the yield of the condensation product. Conclusions: The cyclization of the tetraethylether of 2-methylpentantetracarboxylic-1,1,5,5-acid was investigated according to Dikman. It was shown that 3-methyl-2,6-dicarbethoxycyclo hexane represents the primary reaction product. Its structure was confirmed by the production of 3-methylcyclohexanone with its ketone splitting. There are 11 references, 4 of which are Slavic.

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79-2-24/64

Investigations in the Field of Dikman's Reaction. IV. Cyclization of the Tetra-ethylether of 2-Methylpentantetracarboxylic-1,1,5,5,-Acid

ASSOCIATION: Scientific Research Institute for Organic Semiproducts and Dyes, Moscow
(Moskovskiy nauchno-issledovatel'skiy institut organicheskikh polu-produktov i krasiteley)

SUBMITTED: February 13, 1957

AVAILABLE: Library of Congress

Card 3/3

AUTHORS: Vul'fson, N. S., Zaretskiy, V. I.   SOV/79-28-7-41/64

TITLE: Investigation in the Field of Dikman's Reaction (Issledovaniye
v oblasti reaktsii Dikmana) V. The Cyclisation of the Diethyl
Ester of α-Carbethoxypimelic Acid (V.Tsiklizatsiya dietilovogo
efira α-karbetoksipimelinovoy kisloty)

ABSTRACT: The authors investigated the cyclization of the diethyl ester
of α-carbethoxypimelic acid according to Dikman (Ref 1). Earlier
they had shown that in the cyclization of this ester of α-methyl-
pimelic acid 2 methyl-6-carbethoxycyclohexanone is formed with-
out any doubt. Instead of the normally expected 2-carbethoxy-
cyclohexanone (Formula II) with a simultaneous cleavage of the
diethylcarbonate the authors in boiling xylene in the presence
of powdery sodium obtained the 2,6-dicarbethoxycyclohexanone
(III). It must be noticed that the cyclization of (I) with
the same sodium in alcohol solution does practically not take
place, while that of the tetraethylesters of the pentane- and

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Investigation in the Field of Dikmar/sReaction. V.   SOV/79-28-7-41/64
The Cyclisation of the Diethyl Ester of α-Carbethoxypimelic Acid

2-methyl-pentanetetracarboxylic acids-1,1,5,5 in sodiumethylate
alcohol solution is accompanied by a cleavage of the diethyl-
carbonate and leads to the formation of the β-keto ester (III)
(35%)(Ref 3) and 3-methyl-2,6-dicarbethoxycyclohexanone (44%).
The formation of (III) can be explained by spatial difficulties.
The structure of the compound (III) was proved by its methyl-
ation with methyliodide to (IV) and (V) correspondingly, and
after the hydrolysis and decarboxylation of the latter also
by the formation of the known cyclohexanones (VI) and (VII).
The initial product (I) was produced according to two methods.
(Refs 4,5,6). There are 16 references, 5 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh poluproduktov
i krasiteley imeni K.Ye.Voroshilova (Scientific Research
Institute for Organic Semi-finished Products and Dyes, imeni K. Ye.
Voroshilov)

SUBMITTED: May 11, 1956
Card 2/3

Investigation in the Field of Dikman's Reaction. V.   SOV/79-28-7-41/64
The Cyclisation of the Methyl Ester of α-Carbethoxypimelic Acid

1. Ethyl esters--Chemical reactions   2. Acids--Chemical reactions

Card 3/3

5(3)
AUTHORS: Vinograd, L. Kh., Vul'fson, N. S.   SOV/2o-123-1-25/56

TITLE: Reformatskiy's Reaction Involving Nitrobenzaldehydes
              (Nitrobenzal'degidy v reaktsii Reformatskogo)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 1,
              pp 97 - 98 (USSR)

ABSTRACT: Any efforts to introduce carbonyl compounds containing
              nitro-groups into the Reformatskiy reaction have so
              far been a failure (Ref 1). Also the use of these
              compounds in the Grignard (Grin'yar) reaction gave
              no satisfactory results (Ref 2). The causes of this
              failure, however, are different in each of these cases.
              In the Grignard reaction the reduction of the nitro-
              group by the Grignard reagent is the hindrance. It may
              be overcome by a low reaction temperature (Ref 2).
              Hence, the nitro-group does not inhibit the reaction
              of organometallic compounds with the carbonyl group.
              In the Reformatskiy reaction with carbonyl compounds
Card 1/3   the total zinc remains practically unchanged. If a

Reformatskiy's Reaction Involving Nitrobenzaldehydes   SOV/20-123-1-25/56

mixed organozinc compound ought to be formed, in the
presence of a carbonyl compound, it can be supposed
that the nitro-group contained in it impedes the
interaction of zinc with the halogen ester. It was
possible to confirm this assumption, since the easily
proceeding reaction of acetopherone with bromo acetic
ester is completely stopped by addition of 0,05
mol of nitro-benzene. This occurs even if this reaction
is carried out in tetrahydrofuran in the presence
of mercuric chloride which is known to ease the course
of the reaction (Ref 3). Apparently, the Reformatskiy
reaction in the presence of carbonyl compounds has to
be performed in 2 steps: a) preparation of Reformatskiy
reagens from zinc and ester, b) action exercised by
the latter on a carbonyl compound. The authors used
the method according to reference 4. They succeeded in
producing the corresponding esters of β-oxy-β-nitro-
phenyl-propionic acids from o-, m- and p-nitro benzal-
dehydes as well as from bromo acetic ester. The
successful carrying out of this reaction confirmed the
Card 2/3   above assumption, that the nitro group hinders the

Reformatskiy's Reaction Involving Nitrobenzaldehydes   SOV/20-123-1-25/56

formation of mixed organozinc compounds. A character-
istic of the resulting products is presented in table 1.
There are 1 table and 6 Soviet references.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh
poluproduktov i krasiteley im. K.Ye.Voroshilova (Scientific
Research Institute of Organic Semi-Products and Dyes
imeni K. Ye. Voroshilov)

PRESENTED: May 23, 1958, by B.A.Kazanskiy, Academician

SUBMITTED: April 16, 1958

Card 3/3

AUTHORS: Vinograd, L. Kh., Vul'fson, N. S.   SOV/79-29-1-52/74

TITLE: The Reaction According to Reformatskiy With α-Halogen
                Nitriles (Reaktsiya Reformatskogo s α-galoidonitrilami)
                II. Condensation of Chloro Benzaldehydes With Bromo-Aceto
                Nitrile (II. Kondensatsiya khlorbenzal'degidov c bromatseto-
                nitrilom)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 1,
                pp 245 - 247 (USSR)

ABSTRACT: In the previous reports the authors described the condensa-
                tion of benzaldehyde with bromo-aceto nitrile according
                to the reaction by Reformatskiy which proceeds under for-
                mation of β-oxy-β-phenyl propionitrile. In continuation
                of this work they investigated the condensation of the
                o-, m- and p-chloro benzaldehydes with bromo-aceto nitrile
                under the usual conditions of this reaction. In this
                connection they obtained as in the case of application of
                the non-substituted benzaldehyde the corresponding, pre-
                viously not described β-oxy-β-chloro-phenyl propionitriles.
                The nitriles were characterized by the elementary analysis,
Card 1/2   by the transformation according to Radziszewski (Ref 2)

The Reaction According to Reformatskiy With α-Halogen   SOV/79-29-1-52/74
Nitriles.II.Condensation of Chloro Benzaldehydes With Bromo-Aceto Nitrile

into the also hitherto not described oxyamides and by sapo-
nification into the well-known trans-o-, m- and p-chloro-
cinnamic acids: $ClC_6H_4CHO + BrCH_2CN \xrightarrow{Zn} ClC_6H_4CH(OH)CH_2CN$

$ClC_6H_4CH(OH)CH_2CONH_2ClC_6H_4CH=$
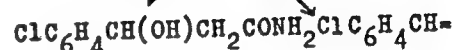
=CHCOOH. It is worth mentioning that the introduction of the
chlorine atom into position 4 of the benzaldehyde increases
somewhat the yield in oxynitrile as compared to the non-
substituted benzaldehyde (53.4 instead of 48.2%), whereas
the introduction of chlorine into position 2, and especially
3 of benzaldehyde leads to a reduction(43.0 and 27%). In
the presence of mercury chloride (Ref 3),however, the yield
in β-oxy-β-(3-chloro-phenyl)propionitrile increases up to
50.7%. There are 7 references, 3 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut poluproduktov i krasite-
                 ley (Scientific Research Institute of Intermediate Products and Dyes)

SUBMITTED: November 29, 1957
Card 2/2

AUTHORS: Zaretskiy, V. I., Vul'fson, N. S.   SOV/79-29-2-13/77

TITLE: Investigation in the Field of the Dikman Reaction (Issledovaniye
              v oblasti reaktsii Dikmana). VI. Cyclization of Diethyl Ester of
              α-Acetyl and α-Benzoyl Pimelic Acid (VI. Tsiklizatsiya
              dietilovogo efira α-atsetil- i α-benzoilpimelinovoy kisloty)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 2, pp 416-421 (USSR)

ABSTRACT: The cyclization of α-acetyl (I) and α-benzoyldiethyl pimelate
              (II) according to Dikman is investigated here. The authors had
              already earlier shown that the cyclization of α-carbethoxydi-
              ethyl pimelate takes place unexpectedly on the non-substituted
              α-carbon atom and leads to 2,6-dicarbethoxycyclohexanone. It was
              of interest to clarify whether the cyclization (I) takes place
              on the substituted α-carbon atom in the direction to the forma-
              tion of 2-carbethoxycyclo-hexanone (III) (with the cleavage of
              ethyl acetate) or of 2-acetylcyclo-hexanone (IV) (with the
              cleavage of diethyl carbonate) (Scheme 1). Actually, in the
              cyclization of (I) in boiling xylene in the presence of 1.4 g-at.
              powdery sodium or 1.4 mol sodium ethylate, compound (III) in
              52-57% yield is formed, in which connection ethyl acetate sepa-
Card 1/3   rates. In the reaction of 1.5 mol sodium ethylate in alcohol

Investigation in the Field of the Dikman Reaction. VI. Cyclization of Diethyl
Ester of α-Acetyl and α-Benzoyl Pimelic Acid

solution, diethyl pimelate formed as chief product (V) in a
yield of 35%, whereas the yield in (III), which separated in
form of 2-phenyl-4,5,6,7-tetrahydro-indazolene-3, amounted to
only 6.5%. Compound (III) cleaves into (V) only to a small ex-
tent (3.1%), whereas (I), on boiling with the alcohol solution
of 0.2 mol sodium ethylate it forms compound (V) (2.2% yield),
and with 1 mol sodium ethylate it yields 56%. The formation of
small quantities (III), on processing (I) with the alcohol solu-
tion of 1.5 mol sodium ethylate, can be explained by the cycli-
zation of (V) which takes place in a low yield. The problem
concerning the reaction mechanism in the presence of powdery
sodium was solved with smaller quantities of sodium (0.9 g-at).
Ethylacetate (27.3%), (V, 13.9%) and (III, 16%) proved to be the
chief products in this connection. Thus, alcoholysis (I) appears
as the first process stage in non-alcoholic medium, under forma-
tion of compound (V), which then cyclizes into (III). An inter-
pretation of this alcoholysis is suggested and the investigation
results obtained are used to set up a scheme of the cyclization
mechanism of α-acetyl and α-benzoyldiethyl pimelate (Scheme 2).

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Investigation in the Field of the Dikman Reaction. VI. Cyclization of Diethyl Ester of α-Acetyl and α-Benzoyl Pimelic Acid

The structure of 2-carboethoxycyclo hexanone (III) was confirmed by the synthesis of the known 2-phenyl-4,5,6,7-tetrahydro-indazolone-3 from cyclohexanone. There are 11 references, 6 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley (Scientific Research Institute for Organic Semi-products and Dyes)

SUBMITTED: December 31, 1957

Card 3/3

5 (3)

AUTHORS: Vul'fson, N. S. Vinograd, L. Kh.   SOV/79-29-4-24/77

TITLE: Reformatskiy's Reaction With α-halogen Nitriles (Reaktsiya
             Reformatskogo s α-galoidnitrilami). III. Condensation of the
             Methoxy-benzaldehydes With Bromo-aceto Nitrile
             (III. Kondensatsiya metoksibenzal'degidov s bromatsetonitrilom)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 4,
             pp 1147-1149 (USSR)

ABSTRACT: The authors previously described the condensation of
             benzaldehyde and chloro-benzaldehydes with bromo-aceto nitrile
             (Refs 1, 2). Further, the condensation of bromo-aceto nitrile
             with o-, m-, p-methoxy- and 3,4-dimethoxy-benzaldehydes were
             investigated under the usual conditions of Reformatskiy's
             reaction. The β-(2-methoxy-phenyl)- and β-(3-methoxy-phenyl)-
             β-oxy-propionitriles, which so far have not yet been describ-
             ed, were accordingly obtained from o- and m-methoxy-
             benzaldehydes as well as with chlorobenzaldehydes and
             unsubstituted benzaldehyde. In the case of p-methoxy- and
             3,4-dimethoxy-benzaldehydes the known nitriles of p-methoxy-
             and 3,4-dimethoxy-cinnamic acids were formed (Refs 3, 4).
             The β-(2-methoxy-phenyl)- and β-(3-methoxy-phenyl)-β-oxy-

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    2

Reformatskiy's Reaction With α-Halogen Nitriles.   SOV/79-29-4-24/77
III. Condensation of the Methoxy-benzaldehydes With Bromo-aceto Nitrile

propionitrile were transformed by hydrogenperoxide into the
amides of β-(2-methoxy-phenyl)- and β-(3-methoxy-phenyl)-β-oxy-
propionic acids, and by saponification into the 2- and 3-
methoxy-cinnamic acids. The condensation of m-methoxy-
benzaldehyde and m-chloro-benzaldehyde (Ref 2) was carried
out in a lower yield than with the o- and p-isomers, while
mercury chloride increased the yield only from 22.1 to
25.7 %. Very good yields were attained with tetrahydrofuran
instead of the usual solvents (Ref 5). In this connection
the yields for o-, m-, p-methoxy- and 3,4-dimethoxy-
benzaldehydes were increased from 49.7 to 70.4 %, from 25.7
to 74 %, from 34.6 to 62 %, and from 23 to 76.3 %, accordingly.
The reaction in tetrahydrofuran proceeded abruptly, thus
shortening   reaction time and decreasing   resin
formation. There are 10 references, 4 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh polupro-
                duktov i krasiteley (Scientific Research Institute of
                Organic Semi-products and Dyes)

Card 2/3

KOROLEV, A.I., otv.red.; VUL'FSON, N.S., zam.otv.red.; BOGDANOV, S.V.,
red.; DOKUNIKHIN, N.S., red.; MASLENNIKOVA, Ye.V., red.; FODIMAN,
I.V., red.; KHOMSKIY, I.G., red.; ZETLIN, V.I., red.; SHPAK, Ye.G.,
tekhn.red.

[Organic intermediate products and dyes; collected articles]
Organicheskie poluprodukty i krasiteli; sbornik statei. Moskva,
Gos.nauchno-tekhn.izd-vo khim.lit-ry. No.1. 1959. 238 p.
(MIRA 13:7)

1. Nauchno-issledovatel'ckiy institut organicheskikh polupro-
duktov i krasiteley.
        (Dyes and dyeing)   (Aromatic compounds)

VUL'FSON, N.S.; IODKO, M.O.

Investigations in the field of Dieckmann reaction. Report
No.1: Synthesis of carbonylene acetic-β-propionic acid and
its ester tagged with C^{14} in the carboxylic group of the
propionic acid residue. Org. poluprod. i kras. no.1:92-
95 '59.   (MIRA 14:11

                    (Propionic acid)
                    (Radioactive tracers)
                    (Dieckmann condensation)

STEPANOV, F. N.; VUL'FSON, N. S.

Investigation in the series of derivatives of acetonitrile. Report
No.1. Hydrolytic splitting of aroylcyanoacetic esters. Org.
poluprod. i kras. no.1:222-230 '59.   (MIRA 14:11)
                    (Acetonitrile)
                    (Cyanoacetic acid)

VUL'FSON, N. S.; DAVYDOVA, S. L.; LUKASHINA, L. I.

Investigation in the series of derivatives of acetonitrile. Report
No. 2: 2-cyanomethylquinoxalone-3 and its derivatives. Org. polu-
prod. i kras. no. 1:231-236 '59.   (MIRA 14:10)
                    (Acetonitrile)

AUTHORS: Vinograd, L. Kh., Vul'fson, N. S.   SOV/79-29-8-53/61

TITLE: Reformatskiy's Reaction With α-Halogen Nitriles. IV. Condensation
                of Ketones With Bromoacetonitrile

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 8, pp 2690-2692 (USSR)

ABSTRACT: In previous papers (Ref 1), the reaction of bromoacetonitrile
                with different aromatic aldehydes was described which takes place
                according to Reformatskiy under usual conditions, and yields the
                β-oxynitriles. The authors carried on with the investigation of
                this reaction, and condensed ketones (acetophenone, cyclohexa-
                none and dibutyl ketone) with bromoacetonitrile; the correspond-
                ing β-oxynitriles resulted. On distillation of β-oxy-β-phenyl-
                butyronitrile, a partial dehydration takes place, and an impuri-
                ty of the nitrile of the β-methyl-cinnamic acid is formed. The
                oxynitrile can be isolated from the higher-boiling fraction by
                crystallization. The pure, unsaturated nitrile was obtained by
                dehydration of the nitrile mixture with potassium bisulfate. The
                solvent used influences the course of reaction. In the case of
                the reaction of bromoacetonitrile with acetophenone, it was found
                that in benzene, toluene and in a mixture of benzene and ether
Card 1/2   mainly resinous products are formed; in dioxane, ether and their

Reformatskiy's Reaction With α-Halogen Nitriles. IV.   SOV/79-29-8-53/81
Condensation of Ketones With Bromoacetonitrile

mixture the maximum yields are 38.5%; the best yields (67.8%)
were obtained when using tetrahydrofuran (Table 1). The nitriles
not described in publications, with the exception of 5-oxy-5-
cyanomethylnonane, were converted into the corresponding amides
and, besides, the nitrile of tne β-methyl-cinnamic acid was
converted into the β-methyl-cinnamic acid. Thus, the nitriles
of the β-methyl-cinnamic-, β-oxy-β-phenyl-butyric-, and β-oxy-
β-butyl-heptanic acid were synthesized. The results of the ex-
periments are given in table 2, the characteristic features of
the amides in table 3. There are 3 tables and 3 references, 2
of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh poluproduktov
i krasiteley (Scientific Research Institute for Organic Semi-
products and Dyes)

SUBMITTED: July 11, 1958

Card 2/2

5(3)   SOV/79-29-8-54/81

AUTHORS: Vul'fson, N. S., Vinograd, L. Kh.

TITLE: Reformatskiy's Reaction With α-Halogen Nitriles. V. Reaction of
              Benzaldehyde and Acetophenone With Chloroaceto-, α-Bromopropio-,
              and α-Bromoisobutyro Nitriles

ABSTRACT: The authors tried to extend Reformatskiy's reaction with bromo-
              acetonitrile described previously (Ref 1) to other α-halogen
              nitriles: to chloroacetonitrile, α-bromopropionitrile, and α-bromo-
              isobutyronitrile. All these nitriles were allowed to react with
              benzaldehyde and acetophenone. In analogy with the reactions of
              chloroacetate, the chloroacetonitrile reacts more difficultly
              than the corresponding bromide, as was expected, and gives smaller
              yields in β-oxynitriles. The α-methyl derivatives of bromoaceto-
              nitrile (α-bromopropionitrile and α-bromoisobutyronitrile) react
              more readily than bromoacetonitrile and give better yields than
              the corresponding β-oxynitriles. The nitriles were identified,
              as previously (Ref 1), by transformation into the corresponding
              β-oxyamides. Yet, not all nitriles reacted in this way. The re-
              action time of α-methyl- and α,α-dimethyl-β-oxy-β-phenylpropio-
              nitrile with H_2O_2 had to be prolonged to 3 hours, and that of

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Reformatskiy's Reaction With α-Halogen Nitriles. V.   SOV/79-29-8-54/8?
Reaction of Benzaldehyde and Acetophenone With Chloroaceto-, α-Bromopropio-,
and α-Bromoisobutyro Nitriles

α-methyl- and α,α-dimethyl-β-oxy-β-phenylbutyronitrile to 8
hours. Only the first three nitriles gave the corresponding
amides in small yields. In the case of α,α-dimethyl-β-oxy-β-
phenylbutyronitrile, even a splitting-up of the carbon chain
takes place, and acetophenone is formed again. On hydrolysis
of nitriles (boiling with KOH for 12-15 hours) surprisingly
no cinnamic acids resulted. This can be explained by the influence
exerted by the α-substituents upon the stability of the carbon
chain. The experimental results are given in two tables. There
are 2 tables. and 11 references, 3 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh poluproduktov
i krasiteley (Scientific Research Institute for Organic Semi-
products and Dyes)

SUBMITTED: July 11, 1958

Card 2/2

5(3).

AUTHORS: Vul'fson, N. S., Zaretskiy, V. I.   SOV/79-29-8-64/81

TITLE: Investigations in the Field of the Dieckmann Ring Formation.
VII. Regrouping of 2-methyl-2-carbethoxycyclohexanone Forming
6-methyl-2-carbethoxycyclohexanone

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 8, pp 2737-2738 (USSR)

ABSTRACT: Since the publications confine themselves (Refs 1-5) to the
description of the regrouping of the 2-carbethoxyalkyl derivatives
of the 2-carbethoxycyclohexanone, it was interesting for the
authors to investigate the analogous regrouping of the 2-alkyl
derivative starting from 2-methyl-2-carbethoxycyclohexanone (I).
As it is known, the diethyl-α-methylpimelinate (Ref 6) the
cyclization of which in boiling benzene in the presence of
powdered sodium according to Dickmann yields, as previously
reported (Ref 7), the compound (II), is easily formed when
compound (I) is boiled in an alcohol solution of sodium ethylate
(0,2 mol). However, under usual conditions diethyl-α-methyl-
pimelinate (40%), the unchanged β-keto ester (I) (20%), and
traces only of the β-keto ester (II) were obtained, whereas the
Card 1/2   boiling of 2-methyl-2-carbethoxycyclohexanone in xylene in the

Investigations in the Field of the Dickmann Ring   SOV/79-29-8-64/81
Formation. VII. Regrouping of 2-methyl-2-carbethoxycyclohexanone Forming
6-methyl-2-carbethoxycyclohexanone

presence of sodium ethylate yields the regrouping forming
compound (II) with a 42% yield (Scheme). It was found that
diethyl-$\propto$-methylpimelinate does not cyclize in the alcohol
solution of sodium ethylate, while its ring formation in boiling
xylene in the presence of sodium ethylate proceeds smoothly and
yields the compound (II) (54%). These facts as well as the
formation of a large amount of $\propto$-methylpimelinate in the course
of the attempt to carry out the regrouping of (I) in an alcohol
medium which failed are convincing proof that the regrouping of
(I) into the analogous 2,6-compound takes place by an opening of
the ring and subsequent cyclization of the resulting diethyl-$\propto$-
methylpimelinate. There are 8 references, 1 of which is Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh poluproduktov
i krasiteley imeni K. Ye. Voroshilova (Scientific Research
Institute of Organic Semi-finished Products and Dyes imeni
K. Ye. Voroshilov)

SUBMITTED: July 4, 1958

Card 2/2

VULFSON, N.S.

PURPOSE: This book is intended for organic chemists and chemical engineers.

COVERAGE: The collection contains 31 articles on methods of synthesizing or producing pyridine, quinoline, and their derivatives from natural sources. No personalities are mentioned. Figures, tables, and references accompany the articles.

VILISOV, I.S.; ZHILIN, R.S.

Synthesis of 3-acyl-4-hydroxy-carbostyrils. Zhur. VHO 5
no. 3:352-353 '60.   (MIRA 14:2)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov
i krasiteley imeni K.Ye. Voroshilova.
                              (Carbostyril)

ZHURIN, R.B.; VUL'FSON, N.S.

Reaction of C-acyla ion of heterocyclic ketoenols. Part 2: Synthesis of α-acetyl- and α-propionyl-γ-phenyltetronic acids. Zhur.ob.khim. 30 no.8:2467-2468 Ag '60.   (MIRA 13:8)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley imeni K.Ye.Voroshilova.
              (Tetronic acid)

KOLCHIN, V.Ye.; VUL'FSON, N.S.

Derivatives of acylacetic esters of the heterocyclic series. Part 2:
Arylides of α- and β-furoylacetic acids, and synthesis of azomethine
dyes from them. Zhur. ob. khim. 30 no.9:3091-3095 S '60.

(MIRA 13:9)

(Furanpropionic acid)   (Dyes and dyeing)

VUL'FSON, N.S.

Investigation in the series of derivatives of acetonitrile. Report
No. 3: Synthesis of substituted ω -cyanoacetophenones. Org. polu-
prod. i kras. no.2:128-136 '61.   (MIRA 14:11)
                    (Acetophenone) (Acetonitrile)

VUL'FSON, N.S.; IODKO, M.O.

Synthesis of β -tetralone. Org. poluprod. i kras. no.2:143-145
'61.   (MIRA 14:11)

(Naphthalenone)

VUL'FSON, N.S.; ZHURIN, R.B.

Cyclization of phenylhydrazones of 3-acyl-4-hydroxycoumarins.
Zhur. VKHO 6 no.2:239-240 '61.   (MIRA 14:3)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov
i krasiteley imeni K. Ye. Voroshilova.
              (Hydrazones)   (Coumarin)

VUL'FSON, N.S.; KOLCHIN, V.Ye.

Derivatives of acylacetic esters of the heterocyclic series. Part 3:
Synthesis of α- and β-thenoyl acetic esters and arylides, and of
azomethine dyes based on them. Zhur.ob.khim. 30 no.10:3425-3430
O '61. (MIRA 14:4)

1. Nauchno-issledovatel'skiy institut organicheskikh poluporduktov
i krasiteley.
(Dyes and dyeing)   (Thiophenecarboxylic acid)

VUL'FSON, N.S.; ZHURIN, R.B.

Reactions of C-acylation of heterocyclic keto-enols. Part 4:5-Acylbar-
bituric acids. Zhur. ob. khim, 31 no.1:261-283 Ja '61.
(MIRA 14:1)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov
i krasiteley.
(Barbituric acid)

ZARETSKIY, V.I.; VUL'FSON, N. S.

Dieckman reactions. Part 8: Cyclization of the diethyl
ester of α-ethyl-α-carbethoxypimelic acid. Zhur. ob. khim.
31 no. 2:484-490 F '61.   (MIRA 14:2)

1. Institut khimii prirodnykh soyedineriy AN SSSR.
         (Heptanedioic acid) (Cyclization)

ZHURIN, R.B.; VUL'FSON, N.S.

C-Acylation of heterocyclic ketoenols. Part 5: Mechanism of the C-acylation of 4-hydroxycoumarin. Zhur. ob. khim. 31 no.3:875-879 Mr '61.   (MIRA 14:3)

1. Institut organicheskikh poluproduktov i krasiteley imeni K. Ye. Voroshilova.
     (Coumarin)   (Acylation)

VUL'FSON, N.S.; ZHURIN, R.B.

C-acylation of heterocyclic keto enols. Part 6: Cyclization
of phenylhydrazones of 3-acyl-4-hydroxycoumarins. Zhur.ob.khim.
31 no.10:3381-3385 O '61.   (MIRA 14:10)

1. Institut organicheskikh poluproduktov i krasiteley imeni
K.Ye.Voroshilova.
            (Coumarin)   (Hydrazones)

VUL'FSON, N.S.

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SEVERIN, Sergey Yevgen'yevich, Institute of Pharmacology and Chemotherapy, Academy of Medical Sciences, Moscow; VUL'FSON, N. S. [possibly P.L. VUL'FSON, Chair, Animal Biochemistry, Moscow State University (1959 position)]- "The importance of karnosis in neurotrophic relations" Session I

Probably
_N.M!_

SHAMARINA, N. N., Physiological Laboratory, Academy of Sciences USSR, Moscow - "Effect of tetanic stimulation on different muscle fibers" II-2-b

STUDITSKIY, Aleksandr Nikolayevich, ZHENEVSKAYA, R. P., and RUMYANTSEVA, O.N., all of the Institute of Animal Morphology imeni A. N. Severtsov, Academy of Sciences USSR, Moscow - "Neurotrophic influence in recovery of structure and function of regenerating muscle" I

TELEPNEVA, V. I., Chair, Animal Biochemistry, Moscow State University, Moscow - "Changes in muscle following denervation" Session II-2-a

YAKOVLEV, N. N., KRASNOVA, A. F., and CHAGOVETS, N.R., all of the Leningrad Scientific Research Institute, Institute of Physical Culture, Leningrad - "Adaptation of energy metabolism in muscle" Session II-2-b

report to be submitted for the Symposium on the Effects of Use and Disuse on Neuromuscular Functions (IUPS), Prague-Liblice, Czech, 18-24 Sep 1962.

VUL'FSON, N.S.; ZARETSKIY, V.I.; DOMANINA, O.N.

Synthesis of ethyl-β-carbethoxyethyl ester of malonic
acid. Zhur. VKHO 7 no.6:709 '62.   (MIRA 15:12)

1. Institut khimii prirodnykh soyedineniy AN SSSR.
                    (Malonic acid)

VUL'FSON, N.S.; ZHURIN, R.B.

Reaction of cycloacylation of heterocyclic keto-enols. Part 7:
Cyclization of phenyl-hydrazones of 3-acyl-4-hydroxycarbostyrils.
Zhur.ob.khim. 32 no.3:991-994 Mr '62.   (MIRA 15:3)

1. Institut organicheskikh poluproduktov i krasiteley i Institut
khimii prirodnykh soyedineniy AN SSSR.
                (Hydrazones) (Carbostyrils) (Cyclization)

VUL'FSON, N.S.; PODREZOVA, T.N.

Dieckmann condensation. Part 9: Cyclization of ethyl ester of
o-(carbethoxymethoxy) phenylacetic acid. Zhur.ob.khim. 32
no.9:3019-3022 S '62.   (MIRA 15:9)

1. Institut khimii prirodnykh soyedineniy AN SSSR i Nauchno-
issledovatel'skiy institut organicheskikh poluproduktov i
krasiteley.
            (Acetic acid)   (Dieckmann condensation)

VUL'FSON, N.S.; KOLCHIN, V.Ye.; ARTEMCHIK, L.K,

Derivatives of acylacetic esters of the heterocyclic
series. Part 4: Synthesis of nicotinoylacetic ester,
arylides, and azomethine dyes prepared from them.
Zhur.ob.khim. 32 no.10:3382-3386 O '62.   (MIRA 15:11)

1. Nauchno-issledovatel'skiy institut organicheskikh
poluproduktov i krasiteley i Institut khimii prirodnykh
soyedineniy AN SSSR.
                      (Pyridinepropionic acid)
            (Dyes and dyeing)   (Schiff bases)